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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

To:

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Date of mailing
(day/month/year) 30.04.2004

Applicant's or agent's file reference
2002BO38A

IMPORTANT NOTIFICATION

International application No.
PCT/US 03/09721

International filing date (day/month/year)
28.03.2003

Priority date (day/month/year)
29.03.2002

Applicant
EXXONMOBIL CHEMICAL PATENTS INC. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

ACKNOWLEDGED
PATENT LEGAL ASSISTANT GROUP
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☒ File
☐ Reminder

MAY 06 2004

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002BO38A	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US 03/09721	International filing date (<i>day/month/year</i>) 28.03.2003	Priority date (<i>day/month/year</i>) 29.03.2002
International Patent Classification (IPC) or both national classification and IPC C07C45/50, C07C45/50		
Applicant EXXONMOBIL CHEMICAL PATENTS INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 09.09.2003	Date of completion of this report 30.04.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Seelmann, M Telephone No. +49 89 2399-8335



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/09721

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-3, 5-8, 10, 11, 15-17 as originally filed
4, 9, 12, 13, 14 filed with telefax on 30.03.2004

Claims, Numbers

1-18 filed with telefax on 30.03.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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EXAMINATION REPORT**

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/09721

- D1** US 5 410 090 cited in the application
- D2** US 6 015 928 cited in the application
- D3** US 5 215 667
- D4** US 3 288 857

The present demand relates to the hydroformylation of olefins by the Co-Flash process characterized by the use of acetic acid as the process acid and the separation of the aqueous acid distillate from an evaporator into a concentrated acetic acid stream and a depleted acetic acid aqueous stream with recycling of the latter in the demetalling stage.

Item V

Reasoned statement under Artikel 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V.1 Amendments - Art. 34(2)b) PCT

The vague and imprecise statement "lower" defining in an unclear manner the olefinic material feed has been removed from claims 7-8 and 16-17 (Art. 6 and Guidelines, C-III, 4.3a PCT). This statement should have been amended by introducing the definition provided in the description on page 8, par. 35 (Article 6 PCT). The present deletion extends the scope of the application to any possible olefinic material, which goes beyond the extent of the application as originally filed. The paragraph 16 has been modified as to end with the last two lines of paragraph 35 as originally filed. On one hand this amendment does not make any sense, on the other hand it leaves the impression that pages 5 to 8, i.e. paragraphs 17 to 35 have been deleted. Even though the applicant stated in his reply of 30.04.2004 that paragraphs 51 and 62 were removed from the description, the amended pages do not support such modifications.

The above-cited amendments do not fulfil the criteria of article 34(2)b) PCT. Since the above problems relate to the dependent claims only, the present report (novelty/inventive step) is established on the amended independent claims provided with the reply of the applicant of 30.04.2001.

V.2 Novelty - Art.33(2) PCT:

D1 pertains to the preparation of aldehyde(s), *i.e.* alcohol(s) via the hydroformylation of olefins by the Co-Flash process followed by hydrogenation comprising the steps of hydroformylation, stripping, demetalling, evaporating, preforming and recovering/recycling product/catalyst/acid and hydrogenating (Fig. 2 and col. 8, line 50 - col. 10, line 10). Even though the examples of **D1** are performed with formic acid, acetic acid is disclosed in this document as an alternative (col. 7, line 66 - col. 8, line 4).

D2 describes the preparation of higher alcohols *via* hydroformylation of olefins followed by hydrogenation (col. 4, lines 1-7). The olefinic material derives preferably from the oligomerization, such as the Octol® or Dimersol® processes, of propene or butene (col. 6, line 45 - col. 7, line 12).

D3 relates to the recovery of the catalyst from the crude reaction mixture of an hydroformylation by employing membrane separation.

D4 relates to an improved hydroformylation process by treatment of the reaction mixture with an aqueous acetic acid followed thereafter by treatment with isobutyl alcohol.

The additional step of separation of the aqueous acid distillate from an evaporator into a concentrated acetic acid stream and a depleted acetic acid aqueous stream with recycling of the latter in the demetalling stage is not disclosed in any of **D1-D4**. The subject-matters of the present claims 1-18 is accordingly novel.

V.3 Inventive step - Art.33(3) PCT:

The present hydroformylation process differs from the one of **D1** in that the aqueous acid distillate from an evaporator is separated into a concentrated acetic acid stream and a depleted acetic acid aqueous stream with recycling of the latter in the demetalling stage. The present technical problem posed is to provide an improved hydroformylation process of olefins by the Co-Flash process. The proposed solutions are processes according to claims 1 or 10.

Formic acid is preferred over other low-molecular weight carboxylic acid, especially acetic acid in this hydroformylation process (cf. paragraphs 12-16 of the description). Nevertheless by using formic acid the man skilled in the art is confronted with the problems of corrosion and plant inefficiency (high maintenance costs, frequent purging, loss of cobalt, etc.; cf. paragraphs 17 to 20 of the description; example on pages 12-14 upto paragraph 60). The problem of acetic acid volatility loss and plant efficiency has been

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/09721

proved to be solved in the present process by separation of the aqueous acid distillate from an evaporator into a concentrated acetic acid stream and a depleted acetic acid aqueous stream and recycling of the latter in the demetalling stage (pages 9-11; paragraphs 41 to 45). Such an improvement could not be foreseen from the prior art knowledge (i.e. **D2-D4**). Therefore the proposed solutions possess an inventive character. An inventive step is recognized for the processes of claims 1 and 10.

V.4 Certain defects in the international application; Certain observations on the international application:

The paragraphs 51 and 62, lines are rendering the scope of the application unclear and should have accordingly been removed (Guidelines CIII-4.3a PCT).

[0011] Here again numerous improvements on the Cobalt Flash Process have been proposed, such as in U.S. Patent Nos. 5,235,112; 5,237,104; 5,237,105; 5,336,473; 5,410,090; 5,457,240; WO 93/24437; and WO 93/24436.

[0012] In the Cobalt Flash Process as currently practiced, after the aqueous phase comprising cobalt formate is separated from the organic phase comprising oxo product in the demetalling reaction, the aqueous phase is passed to an evaporator where cobalt formate is concentrated before being passed to a preformer wherein the aqueous cobalt salt (Co^{+2}) is converted to oil soluble Co^{-1} by reaction with carbon monoxide and hydrogen in the presence of an oil phase (commonly an aldehyde or alcohol, such as the product of the oxonation reaction). The cobalt is then passed into the stripper reactors and/or oxonation reactors to supplement the cobalt recovered in the strippers. Additional fresh cobalt catalyst is typically necessary and is added as, for instance, cobalt acetate.

[0013] Although the prior art suggests that acetic acid, propionic acid, and the like, may be used in the demetalling stage, numerous patents state that formic acid is preferred (such as the aforementioned U.S. '067 at col. 5, line 55+; U.S. '112 at col. 7, line 55+; U.S. '240 at col. 8, line 15; and U.S. '473 at col. 7, line 63+).

[0014] At least part of the reason for the preference of the lower molecular weight organic acid is the lower solubility of formic acid relative to acetic acid in the aldehyde product-containing oil phase separated from the cobalt values in the demetalling reaction. The acetic acid is difficult to remove from the desired product and moreover forms acetate esters with alcohols that are still more difficult to remove.

[0015] Moreover, too much acetic acid is lost in the evaporator used to concentrate the cobalt values after the demetalling reaction. Significantly more acetic acid is lost in this stage relative to formic acid. This is because acetic acid has the curious property of being more volatile than its lower molecular weight congener, formic acid, at least at low concentrations typically used in the Cobalt Flash Process.

[0016] Another reason for the preference of formic acid in practice is that formic acid is a natural by-product of the hydroformylation reaction; thus the loss of formic acid in the demetalling reaction (to aldehyde product contamination) is as a heat sink in the reaction. The amount of paraffins to use can be determined by one of ordinary skill in the art.

[0036] Yet still another preferred embodiment is the use of LAOs and/or LIOs (linear alpha olefins and linear internal olefins, respectively), which terms are well-known in the art, as olefinic feed.

[0037] Other more preferred olefinic materials used as a feed into the oxonation reactors include oligomers produced by the Octol® process or the Dimersol® process. See, for instance, the previously mentioned U.S. Pat. No. 6,015,928. Yet another more preferred olefinic material includes oligomers produced using solid phosphoric acid (SPA) catalysts and those produced using ZSM-57 catalysts, procedures which are known in the art.

[0038] Another more preferred feed comprises 0.1 - 20 wt.% isooolefin, particularly isobutylene and or isoamylene, more preferably wherein the content of the isobutylene and/or isoamylene is from 0.5 - 5.0 wt.%.. A preferred source of such a feed is the unreacted effluent from an MTBE unit, which is a yet still more preferable embodiment.

[0039] Reactor conditions for each stage are well-known in the art and are not critical to achieve the objects of the present invention. Typical hydroformylation reaction conditions include a temperature of about 125°C to about 200°C, a pressure of about 2,170 Kpa (300 psig) to about 10,444 Kpa (1500 psig), and a catalyst to olefin ratio of about 1:1000 to about 1:1. The molar ratio of hydrogen to carbon monoxide is usually about 1 to about 10. The process may also be carried out in the presence of an inert solvent such as ketones, e.g, acetone, or aromatic compounds such as benzene, toluene and the xylenes.

[0040] One aspect of the present invention is separating the decobalted distillate generated in the evaporator step (step (6) in the Cobalt Flash Process set forth above) into an acetic acid-depleted water stream, preferably to be recycled as aldehyde product wash water as described in more detail below, and an acetic acid-rich stream, preferably to be recycled as process make-up acid, e.g., to the stripper reactor(s) and/or to the demetalling stage.

[0041] According to the present invention, the condensate generated from the evaporator overhead distillate is then separated into an acetic acid-rich stream and

reaction, particularly after it has been washed to remove acetic acid, such as in accordance with the aspect of the present invention discussed previously (i.e., oxonation reaction produces some alcohol, which gets passed through to the organic phase in the wash tower). The actual source of organic alcohol used in the preformer is *per se* not critical for the purpose of removing formic acid; it may be, for instance, that an alcohol other than product alcohol is preferred, depending on the circumstances. Overall process optimization, however, may depend on using internal process fluids, i.e., wash aldehyde or final product alcohol, as the organic alcohol used in the preformer.

[0049] Thus, it is important in this second aspect of the present invention that formate ester formation be maximized while minimizing acetate ester formation to be within an acceptable level in the final product.

[0050] The material from the preformer is then passed into the stripper reactor(s) to complete the recycling of the cobalt values. The formate ester formed in the preformer is removed from the system into the organic phase in the demetalling step.

EXAMPLES

[0051] The following examples are meant to illustrate the present invention. Numerous modifications and variations are possible and it is to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

[0052] The prior art Cobalt Flash Process unit was operated using linear C₉ olefin feed and using about 1.5 wt.% acetic acid as the process acid. Overall acid loss rate is approximately 113-136 Kg/hr (250-300 lbs/hr) of acetic acid, compared to 23 Kg/hr (50 lbs/hr) of formic acid lost during baseline formic acid operations using the same concentration of acid in water. The acetic acid in the overhead from the evaporator contained about 5.5 wt.% acetic acid, compared to about 0.1 wt.% formic acid in the case where the latter is used as process acid. The final C₁₀ alcohol product recovered after hydrogenation contained about 2 wt.% acetate ester; typically no more than 0.5 wt% acetate ester is considered acceptable. An acceptable level is

readily achieved using formic acid as process acid in the prior art Cobalt Flash Process.

[0053] The same Cobalt Flash Process unit is modified and operated according to the present invention using acetic acid as process acid, as detailed below. The modified unit is operated using the same linear C₉ olefin feed as above and using about 11 wt. % acetic acid as process acid, allowing about 2-5 times more cobalt loading than allowed by the use of formic acid as process acid. The unit component parts are otherwise operated under the same conditions as in the comparative experiment above, e.g., the oxonation unit and stripper reactor temperature and pressures are within the typical ranges set forth above.

[0054] Acetic acid is added to the stripper reactor in the Cobalt Flash Process to convert the cobalt catalyst to cobalt acetate. This stream is then water washed and sent to a settling drum for the aqueous phase, comprising the cobalt values, and the organic phase, comprising the oxo aldehyde product, to separate, as in the prior art process using formic acid.

[0055] The aqueous solution comprising acetic acid and cobalt acetate is passed to the evaporator operating at conditions sufficient to cause water to distill overhead. A portion of acetic acid also distills over. The concentrated cobalt acetate portion is taken as the bottom fraction from the evaporator and this concentrated cobalt acetate is passed to the preformer.

[0056] The overhead distillate from the evaporator is condensed and passed through a reverse osmosis system including a polymeric membrane comprising an aromatic polyamide. A commercially available system from Osmonics, Inc., is used. In this case the overheads from the evaporator comprised 5.5 wt.% acetic acid. This stream is separated into a concentrated acetic acid stream and an acetic acid-depleted water stream in a 2-pass reverse osmosis system. The first pass comprises of 5 housings, arranged so that the stream is first passed through 2 parallel housings and then combined and passed through three housings in series (i.e., a 2-1-1-1 array). Each of the housings contain 6 Model AD4040 elements supplied by Osmonics, Inc., for a total of 30 elements. The first pass is operated at 8,375 Kpa (1200 psig) and 25°C. A small balance tank is placed between the first and second pass. The second pass comprises 2 housings in series, each containing 6 Model

AD4040 elements, totaling 12 elements. The second pass is operated at 6,307 Kpa (900 psig) and 25°C. This system produces a 0.3 wt% acetic acid-depleted water stream (or "permeate" stream) at 27.3 l/min (7.2 gallon per minute (gpm)) and a 10.6 l/min (2.8 gpm) acetic acid concentrate stream with 18 wt% acetic acid.

[0057] The permeate stream is then used to wash the crude aldehyde from the demetalling stage in a 5-stage wash tower. The acetic acid-rich stream is recycled to the stripper reactor.

[0058] A portion of C₁₀ alcohol product is then metered into the preformer in an amount estimated to maximize formate ester formation and minimize acetate ester formation and mixed with synthesis gas and with the concentrated aqueous cobalt acetate solution taken off as bottoms from the evaporator. This stream is then passed, after about an hour residence time in the preformer, to the stripper reactor and thus recycled back into the system.

[0059] The C₁₀ alcohol finish product contains acetic acid levels which are within specification (<0.5 wt. %). Acetic acid losses are comparable to those in the prior art Cobalt Flash Process unmodified by the present invention. It is very surprising and unexpected that the use of acetic acid did not deactivate the hydrogenation unit, particularly considering the much higher loadings of acetic acid used in this example according to the present invention, when compared to the loading using formic acid allowed by the prior art Cobalt Flash Process.

[0060] Accordingly, the present invention clearly solves technical problems associated with the use of acetic acid in the Cobalt Flash Process and allows for the replacement of formic acid in the prior art process. It thus achieves at least two advantages, which are (1) avoiding the corrosive effects of formic acid on the process reactors, and (2) providing for increased cobalt capacity by higher solubility of cobalt acetate over cobalt formate.

[0061] As previously mentioned, the aldehyde product typically is processed downstream, such as by hydrogenation and distillation to alcohol or by further oxidation to acid. These products may also be further processed to more valuable species. For instance, it is particularly beneficial to esterify the alcohols produced according to the present invention for synthetic lubricant and plasticizer end uses.

CLAIMS:

What is claimed is:

1. In the hydroformylation of olefins by the Cobalt Flash Process, wherein an olefinic material is contacted with synthesis gas in the presence of a cobalt hydroformylation catalyst to produce an aldehyde product containing one more carbon atom than the olefinic material, the improvement comprising using acetic acid as the process acid and separating an aqueous acetic acid distillate from an evaporator, used after a demetalling stage, into a concentrated acetic acid stream and an acetic acid-depleted water stream, and using the acetic acid-depleted water stream to wash an organic phase comprising crude aldehyde product from the demetalling reactor.
2. The process according to Claim 1, the improvement further comprising "adding an organic alcohol to a preformer reactor whereby formic acid present in said preformer is converted to the corresponding formate ester of the organic alcohol."
3. The process according to Claim 2, wherein said separating is by reverse osmosis using a polymeric membrane comprising an aromatic polyamide.
4. The process according to Claim 2, wherein said separating is by pervaporation using a ceramic membrane.
5. The process according to Claim 2, wherein the organic alcohol added to said preformer is provided by recycling a portion of the aldehyde washed with said acetic acid-depleted water stream.
6. The process according to Claim 2, further comprising a step of hydrogenating said aldehyde to an alcohol and wherein a portion of said alcohol is recycled to said preformer.
7. The process according to Claim 1, wherein the olefinic material that is

hydroformylated is made by oligomerizing an olefinic material over a siliceous acidic monodimensional zeolite selected from ZSM-22 and ZSM-23 having acidic pore activity and wherein the zeolite surface is rendered substantially inactive for acidic reactions with 2,4,6-collidine.

8. The process according to Claim 7, wherein said olefinic material is provided by n-butene and propylene in the ratio of about 1:0.01 to 1:0.49.

9. The process according to Claim 1, wherein the olefinic material that is hydroformylated is made by a process selected from the Octol® process, the Dimersol® process, an oligomerization process using a solid phosphoric acid catalyst, and an oligomerization process using ZSM-57.

10. A process for making an aldehyde by hydroformylation comprising:

(a) contacting synthesis gas with an olefinic organic compound in the presence of a cobalt carbonylation catalyst in one or more oxo reactors to produce a crude product comprising an aldehyde;

(b) passing a crude product produced in said one or more oxo reactors to one or more stripper reactors where the crude product is contacted with water, acid, and synthesis gas, wherein cobalt carbonyl is taken off overhead of said stripper reactors and crude aldehyde is taken off at the bottom portion of said stripper reactors;

(c) passing the portion taken overhead, comprising cobalt carbonyl, from the one or more stripper reactors back to the one or more oxo reactors and passing the bottom portion, comprising crude hydroformylation product and cobalt values, from the one or more stripper reactors to one or more demetalling reactors, wherein the cobalt values are converted into cobalt acetate;

(d) separating the crude hydroformylation into an aqueous phase, comprising cobalt acetate, and an organic phase, comprising the crude hydroformylation product;

(e) recovering the aldehyde phase and passing the aqueous phase to an evaporator;

(f) concentrating the aqueous phase comprising cobalt acetate in said evaporator by distilling off a stream comprising water and acetic acid and taking a bottom portion comprising cobalt acetate from said evaporator comprising concentrated cobalt acetate;

(g) passing said concentrated cobalt acetate to a preforming stage wherein said portion comprising concentrated cobalt acetate values is contacted with synthesis gas in the presence of an organic phase to form cobalt carbonyl;

(h) passing said cobalt carbonyl from the preformer to said one or more stripper reactors; and

(i) separating said stream comprising water and acetic acid from said evaporator into an acetic acid-rich stream and acetic acid-depleted water stream and using the acetic acid-depleted water stream to wash said aldehyde phase recovered in step (e) in a wash tower, whereby an acetic acid-depleted aldehyde phase is obtained.

11. The process according to Claim 10 further comprising: adding an organic alcohol to said preforming stage in an amount and for a time sufficient to convert a substantial portion of formic acid impurities into formate esters of said organic alcohol while avoiding a substantial portion of acetic acid conversion to acetate esters of said organic alcohol.

12. The process according to Claim 11, wherein said separating in step (i) is by reverse osmosis using a polymeric membrane comprising an aromatic polyamide.

13. The process according to Claim 11, wherein said separating in step (i) is by pervaporation using a ceramic membrane.

14. The process according to Claim 11, wherein the organic alcohol added to said preformer is provided by recycling a portion of the aldehyde washed with said acetic acid-depleted water stream.

15. The process according to Claim 11, further comprising a step of hydrogenating said aldehyde to an alcohol and wherein a portion of said alcohol is recycled to said preformer.

16. The process according to Claim 11, wherein the olefinic material that is hydroformylated is made by oligomerizing an olefinic material over a siliceous acidic monodimensional zeolite selected from ZSM-22 and ZSM-23 having acidic pore activity and wherein the zeolite surface is rendered substantially inactive for acidic reactions with 2,4,6-collidine.

17. The process according to Claim 16, wherein said olefinic material is provided by n-butene and propylene in the ratio of about 1:0.01 to 1:0.49.

18. The process according to Claim 11, wherein the olefinic material that is hydroformylated is made by a process selected from the Octol® process, the Dimersol® process, an oligomerization process using a solid phosphoric acid catalyst, and an oligomerization process using ZSM-57.